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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
RICKMAN, HOLLY C	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
01/03/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/768,347	ALBRECHT ET AL.	
	Examiner	Art Unit	
	Holly Rickman	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-25 and 27-31* is/are pending in the application.

4a) Of the above claim(s) *9,10 and 17-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-8,11-16,23-25,27-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/30/07 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 30 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The original disclosure fails to provide support for the newly added claim limitations requiring that the ions used in the methods of claims 1 and 23 have an atomic mass that is greater than or equal to 20.

Applicant's references original claims 2, 4, and 24-25 as support for this newly added limitation. However, the aforementioned claims merely cite lists of suitable ions limited to H+

He+, Ne+, Ar+, Kr+, Xe+, Ga+, Hg+, and In+. This does not provide support for an atomic mass range that is greater than or equal to 20.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-3, 7-8, 14-16, 23-24, and 27-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Klemmer et al. (US 6849349).

Klemmer discloses a magnetic recording medium formed by irradiating a magnetic medium with magnetic grains thereby inducing exchange coupling between grains. The reference shows implantation energies corresponding to the claimed acceleration voltage of from about 10-50 keV (see col. 1, lines 16-24 and lines 50-62; col. 4, lines 20-22; col. 5, lines 5-7 and lines 32-34; Fig 7; Fig 9).

With respect to claim 3, Klemmer discloses the use of Ar and He which are both gases at ambient temperature and thus, inherently satisfy the claim limitation directed to ionizing a gas to create ions.

The examiner notes that Ar has an atomic mass of 39.95 and thus, meets the limitations of claims 30-31.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-3, 7-8, 11, 14-16, 23-24, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravelosona-Ramasitera et al. (US 6605321).

Ravelosona-Ramasitera et al. disclose a method of treating a material by irradiating with ions such as He+. The irradiation orders the material thereby enhancing the magnetic anisotropy of the materials and providing magnetic grains that are ferromagnetic. The reference teaches low energy ions having an energy of 200 keV or less is suitable for use in the invention. An irradiating particle density of 5x10E15 to 4x10E16 is suitable for us in the invention. (see col. 2, lines 3-61 and claim 1, col. 6, line63 to col. 7, line1).

The reference does not explicitly state that the irradiation process induces "exchange coupling between grains" as required by the present claims. However, the examiner contends that this is necessarily a feature of the reference. The reference teaches that the magnetic anisotropy of the film is "perfectly homogeneous" which indicates that grains are uniformly transformed into a ferromagnetic material (col. 6, lines 45-49). Because these grains are adjacent to one another and formed by substantially the same method as claimed, one of ordinary skill in the art would expect them to exhibit ferromagnetic exchange coupling.

It has been held that where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the burden of proof is shifted to applicant to show that prior art products do not necessarily or inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC §102 or on prima facie obviousness under 35 USC §103, jointly or alternatively. *In re Best, Bolton, and Shaw*, 195 USPQ 430. (CCPA 1977).

Ravelosona-Ramasitera et al. disclose all of the limitations of the claims as detailed above except for the claimed acceleration voltage of 10-50 keV or 20-30 keV. The reference teaches an acceleration voltage of 200 keV or less and teaches that it is desirable to use "low energy ions" (col. 2, lines 7-14) and that the choice of particle energy can be adjusted in order to obtain low uniform displacement densities in the film (col. 4, lines 15-40). It is the examiners contention that it would have been an obvious to one of ordinary skill in the art at the time of invention to choose an optimal acceleration voltage from within the broadly claimed range of 200 keV or less based on the desired structural modifications of the irradiated material.

In the absence of evidence of unexpected results associated with the claimed ranges of 10-50 and 20-30 keV, the examiner maintains that a prima facie case of obviousness has been made.

With respect to claim 3, Ravelosona-Ramasitera discloses the use of He ions wherein He is a gas at ambient temperature and thus, inherently satisfies the claim limitation directed to ionizing a gas to create ions.

8. Claims 4-5 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Klemmer et al. (US 6849349) in view of Takigawa et al. (US 4481042).

Klemmer et al. teach all of the limitations of the claims as detailed above, except for the use of Ga+, Hg+ or In+ ions or ions formed from a liquid metal ion source. Klemmer et al. does teach that the irradiation process taught therein " may be performed with different types of ion species." Examples of the ions suitable for use in the invention are given and include B+.

Takigawa et al. teach an ion implantation method that uses ions such as Ga+ or B+. The reference teaches that the ion beam used in the invention is formed from a liquid metal ion source.

It would have been obvious to one of ordinary skill in the art at the time of invention to substitute the use of Ga+ for the B+ ions taught by Klemmer et al. in view of the art recognized equivalence of Ga+ and B+ for ion implantation. It would have been obvious to one of ordinary skill in the art to form these materials from a liquid metal ion source as suggested by Takigawa et al.

9. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ravelosona-Ramasitera et al. in view of Baglin et al. (US 6331364).

Ravelosona-Ramasitera et al. (US 6605321) teach all of the limitations of the claims as set forth above except for the longitudinal magnetization of the medium or the magnetization in between perpendicular and longitudinal (i.e. between 0-90°).

Baglin et al. teach that it is known in the art to form FePt-type media having perpendicular magnetization, longitudinal magnetization or magnetization of less than 45 degrees (col. 6, line 65 to col. 7, line 8).

It would have been obvious to one of ordinary skill in the art to adjust the magnetization formed by the method disclosed by Ravelosona-Ramasitera et al. in accordance with the teachings of Baglin and the desired form of recording.

10. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Klemmer et al. (US 6849349) in view of Baglin et al. (US 6331364).

Klemmer et al. teach all of the limitations of the claims as set forth above except for the perpendicular or longitudinal magnetization of the medium or the magnetization in between perpendicular and longitudinal (i.e. between 0-90°).

Baglin et al. teach that it is known in the art to form ordered media having perpendicular magnetization, longitudinal magnetization or magnetization of less than 45 degrees (col. 6, line 65 to col. 7, line 8).

It would have been obvious to one of ordinary skill in the art to adjust the magnetization formed by the method disclosed by Klemmer et al. in accordance with the teachings of Baglin and the desired form of recording.

Response to Arguments

11. Applicant's arguments filed 5/21/07 have been fully considered but they are not persuasive with regard to the rejections of the claims in view of Ravelosona-Ramasitera et al (alone and in combination with Baglin et al.).

Applicant argues that Ravelosona-Ramasitera fails to disclose or suggest that claimed feature of using an acceleration voltage of between 10-50 keV. As acknowledged by Applicant, the reference teaches using "low energy ions having an energy of the order of one or two hundred keV." (col. 2, lines 9-11 of Ravelosona-Ramasitera).

The examiner maintains the position of record that it would have been obvious to optimize the acceleration voltage taught by Ravelosona-Ramasitera for the reasons set forth above. Given the teaching in Ravelosona-Ramasitera (col. 4, lines 20-25) that optimization of irradiating element and its energy is obvious to control the structural modifications of the irradiated material, it is prima facie obvious to adjust the acceleration voltage of the claimed ions. As such, the burden is shifted to Applicant to establish that there is a patentable distinction between the broadly claimed range of 10-50 keV and the narrowed range of claim 7 requiring 20-30 keV. Applicant's arguments do not appear to address the particular motivation cited in the rejection above for optimizing the acceleration voltage range.

The examiner also notes that it is well known in the prior art to adjust acceleration voltage of ions within a wide range for use in treating magnetic recording media. Applicant's attention is directed to Segar et al. (US 6368425) for an example of a teaching of adjusting acceleration voltage between a broad range of 2-500 keV (see col. 5, line 65 to col. 6, line 11 for

instance). Thus, it is clear that the state of the prior art is such that optimizing acceleration voltage within wide limits was known at the time of invention.

Response to Arguments

12. Applicant's arguments filed 10/30/07 have been fully considered but they are not persuasive.

Applicant argues that a prima facie case of obviousness has not been set forth with respect to Ravelosona-Ramasitera.

The examiner respectfully disagrees.

As noted above, the claims of Ravelosona-Ramasitera clearly disclose a range of between 0 and 200 keV for ion acceleration voltage. The reference teaches that the choice of particle energy can be adjusted in order to obtain low uniform displacement densities in the film (col. 4, lines 15-40). Thus, determination of an optimal acceleration range from within this range would have been well within the purview of one of ordinary skill in the art at the time of invention.

It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

The examiner notes that the rejection of claims 4-5 and 25 in view of Ravelosona-Ramasitera has been withdrawn. New rejections of the claims in view of Klemmer et al. has been set forth herein.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chappert et al. ("Planar PAtterned Magnetic Media Obtained by Ion Irraditation", June 1998, Science, Vol. 280, pp 1919-1922) is cited as art of interest.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Holly Rickman
Primary Examiner
Art Unit 1794

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December 31, 2007